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COLLECTING METHODS FOR AMPHIBIANS AND REPTILES

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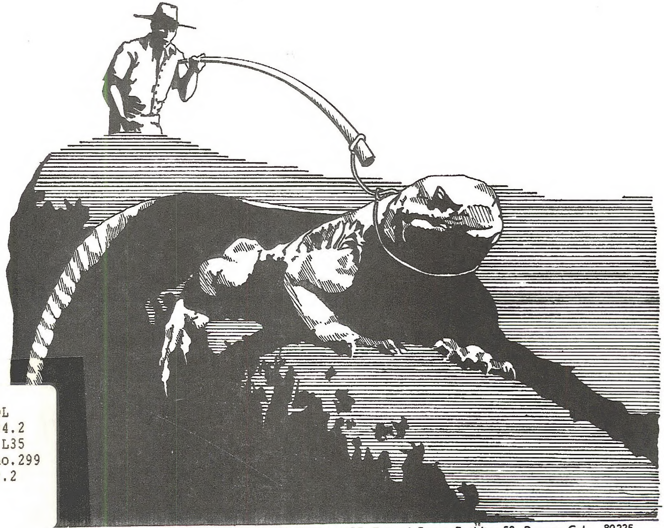

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METHODS FOR THE COLLECTION OF AMPHIBIANS AND REPTILES

Because amphibians and reptiles frequent terrestrial, arboreal, fossorial or aquatic habitats, they require various collecting methods. Perhaps the simplest technique for collecting many reptiles and amphibians involves a "slap of the hand over them." The following techniques offer more sophisticated and hopefully more successful alternatives.

Methods of Collection in Water

The dip net, consisting of a metal hoop with a net fixed to a wooden pole, provides a versatile collecting tool. A fine mesh net can retain small tadpoles and salamander larvae, while coarser mesh net, larger hoop, and longer pole neatly entraps small turtles (Lagler, 1943).

The seine, a more elaborate variation of the dip net, can be placed across small creeks or streams. From a point upstream collectors move toward the seine turning over stones and loose objects. Specimens sweep downstream with the stream's current ending in the seine. Seining is most effective for the collection of adults and larvae in waters free of dense aquatic vegetation.

An insect collecting net works as a miniature seine when held down against the bottom of a stream with the opening of the net upstream. The tadpoles of the tailed frog (*Ascaphus truei*) and other amphibian larvae readily fall into a well-placed insect net, (Svihla, 1959).

Martof (1963) describes a stationary, solid sheet of plastic which collects various larvae. Stream dwelling organisms, including the larvae of shovel-nosed salamanders (*Leurognathus sp.*), are corraled with a dam of polyethylene plastic, supported by a wall of stones. The specimens gather near the bottom of the plastic sheet.

In waters where thick vegetation persists, i.e. hyacinths, dredging particularly aids in collection. Goin (1942) describes a dredge consisting of two troughs held by hinges (Figure 1). The lower trough is shorter and covered with a finer mesh of chicken wire than the upper trough. When submerged and brought up under a mass of hyacinths, the dredge captures animals living among the roots. Various meshes of wire give a degree of selectivity to the collecting operation. All small aquatic vertebrates succumb to this type of dredge.

Conventional fishing techniques provide means of collecting amphibians and reptiles. Both adult and larval salamanders and turtles take fish or meat baits from a hook and line arrangement. Most turtles take a baited hook simply attached to a 12 inch, No. 16 steel wire, leading to a 4 foot, No. 24, linen seine twine, in turn tied to one end of a 6 to 8 foot pole. The pole is pushed into the bottom of a pond while the bait floats on the water's surface. In general, Lagler (1943) finds that the larger the hook, the larger the turtle captured. Larger frogs take a hook with a piece of colored cloth attached to it. The mud-puppy (Necturus maculosus) is frequently taken during winter months by fishing through holes in the ice.

An electric shock device stuns small amphibians. An effective electric shocker, described by Gunning and Lewis (1957), consists of a 230-volt, 180 cycle alternating current, and a portable generator with electrodes for collection in either lake or stream. The electric shock readily stuns frogs, salamanders, snakes, and turtles. Because specimens sink after being shocked, this method is recommended for clear, shallow water.

Anderson and Smith (1950) describe a stronger shocker used for stunning snakes, lizards, and amphibians: two 6-volt lantern batteries connected to a Ford Model-T spark coil. A doorbell button controls the current. The voltage is high and can be fatal to small amphibians (Figure 2).

Selective collecting can be done in a number of ways. Frogs, lizards, and snakes can be collected with a .22 cal. pistol or rifle loaded with various sizes of dust or bird shot. For turtles, a .410 shotgun is effective, but isolated individuals shot in the water become difficult to recover. Shooting over water is hazardous and requires great caution and observance of existing laws. Sunning turtles make the best targets (Lagler, 1943).

As discussed by Lagler (1943), gaffing for large turtles may occasionally work. A gaff consists of several sharply pointed 2 inch hooks placed on the end of a 2 foot piece of .375 inch steel rod which in turn is fastened to a stout pole of 6 feet. Spearing for turtles requires skill and only a direct blow penetrates the hard carapace of most. A turtle should be gaffed beneath the edge of the carapace.

"Noodling" for hibernating turtles refers to probing with bare hands and feet or with a blunt steel rod in soft, muddy bottoms of creeks, springs, or under banks of rivers. This method effectively works for snappers (Lagler, 1943). From a small boat with a 7 horsepower motor, map turtles (Graptemys spp.) can be captured by hand by maneuvering a boat along the shoreline (Chaney and Smith, 1950). Incidentally, this method yielded the first large sample of map turtles.

Funnel-type traps lend themselves favorably to pond habitats. Carpenter (1953) describes a special mechanism for use in large pools, consisting of a cylindrical funnel constructed of .25 inch hardware cloth with an anchor rope of 6 to 10 feet attached. This type efficiently secured adult and larval tiger salamanders (Ambystoma tigrinum) from pools too deep to seine. Both larvae and adult frogs can be collected using this technique. The funnel opening of the trap should be oriented parallel to the shoreline; then animals moving along the bank naturally come into contact with the openings.

Moulton (1954) describes a funnel trap for collecting frogs and salamanders during their breeding season. It consists of a rectangular box of wire screening placed on a wooden frame with a funnel inserted into the box, 2.5 inches above the floor of the box. The whole trap lies level with the ground in a shallow depression with the outside entrance of the funnel facing away from the pond. A wire collar about the inner end of the funnel aids in preventing escape of captured animals. The funnel of this trap can be placed in an opening of a low fence of reinforced tar paper, surrounding a portion of a pond. The water behind the trap provides "bait" for breeding salamanders and frogs crawling toward the pond during rainy nights.

Pirnie (1935) and Legler (1960) describe similar hoop-type funnel traps for turtles. Legler's trap consists of 4 hoops (made of aluminum tubing) which thread into a bag of .75 inch mesh netting. The hoops lie at each 12 mesh interval; a throat at each end completes the trap. Two lines tied to the second hoop of the opposite end hold the throats in place. Bait is suspended from inside the net so that it hangs between and above the openings of the throats. A purse-string mechanism controls the aperture of the funnel. Hoop traps seem most effective in shallow waters, and therefore must be checked periodically to prevent the drowning of trapped turtles (Figure 3).

Breen (1949) describes an effective pitfall turtle trap. A barrel is weighted with stones and sunk in the water so that its top is nearly level with the surface of the water. A board ramp, partly submerged in the water, rides over the edge of the mouth of the barrel. A piece of raw meat rests on the ramp. A turtle ascending the ramp falls into the barrel after passing the point of balance.

Another type of turtle pitfall trap consists of a rectangular wooden frame fitted with a wire hamper attached below it (Lagler, 1943). The inner edge of the frame bears headless nails which project downward. As the trap floats, turtles climb up on the wooden frame to sun themselves. Upon leaving, some turtles plunge into the center of the trap and the projecting nails prevent them from escaping.

Franklin (1947) describes an exclusive, inexpensive snare for water snakes, while utilizing a 3 pronged sterilizing forcepts attached with scissor-grips to the end of a 12 foot cane pole. A weight attached to the scissor-grips hold the prongs open. The prongs are controlled by a heavy cotton cord, which extends from the scissor-grips and passes through guides constructed along the pole. This snare effectively captures water snakes (Natrix sp.) and water moccasins (Agkistrodon sp.).

Methods of Collection on Land

Several simple but effective traps for both reptiles and amphibians rely on the concept of the pitfall.

Lannom (1962) describes a trap suitable for catching zebra-tailed lizards (Callisaurus draconoides) and fringed-toed lizards (Uma sp.). A gallon jar is burried until level with the ground. An artificial, barbless, dry trout fly hangs 1 or 2 inches above the jar by a length of two-pound test line. As lizards jump for the fly they fall into the jar.

Banta (1957) describes a lizard trap in which a 5-quart tin can is placed in the ground (height 24 cm, inside diameter 6.6 cm). A piece of cardboard propped up with rocks covers the sunken can. Reptiles seeking cover fall into the pit (Figure 4).

Rodgers (1939) constructed a box trap (10 inch x 10 inch x 32 inch) with trap doors of cardboard situated in the top. The trap lies flush with the ground. When a lizard crawls onto the false door the combined weight causes the door and the lizard to drop. This trap is designed for species of whiptail lizards (Figure 5).

Funnel traps allow animals to readily enter but present an obstacle when they exit. Fitch (1951) relates an effective funnel trap for catching lizards and snakes: "The model used consists of a piece of hardware cloth wire, .25 of .125 inch mesh, rolled into a cylinder and held in this shape by having the edges turned back and pounded together. An entrance funnel of the same material is fitted firmly into each end. First, each end of the cylinder is turned inward at right angles for .5 inch or so, forming a skirt. The elasticity of the hardware cloth tends to hold the funnel in place when it has been forced into the cylinder as far as it will go. Shingle nails woven through the meshes of the funnel and the end of the cylinder to maintain firm contact between them provided reinforcement which was found to be specifically desirable in traps liable to be disturbed by predators."

To protect the captured animals, the traps must be sheltered from direct sunlight. Also traps can be placed where natural objects guide the animals to the mouth of the funnel.

Dargan and Stickel (1949) describe more elaborate funnel traps with drift fences constructed of hardware cloth of 12 inches high and 25 feet long. Each fence guides animals into the end of the trap. It was reported that snakes followed the drift fences and were guided into the trap by a 2 foot wing, placed obliquely at each corner of the trap.

A funnel trap for lizards is described by Vogt (1941). With narrow boards nailed to the edge of its underside, a wooden platform, 3.5 x 3.5 feet, rests 3 inches off the earth. Wire mesh covers the bottom. Two gaps are left in diagonally opposite corners, one closed with a plug and the other containing a funnel. The cover of wood attracts lizards.

Museum snap traps can capture lizards especially when baited with large beetles or grasshoppers (Heatwole, Maldonado, and Ojasti, 1964). A live insect is tied on its back to the treadle. The movements of the insect's legs are not sufficient to spring the trap but do attract lizards. Meat, fruit, peanut butter, or almost anything that will attract insects is also effective bait.

Carpenter (1955) utilizes a sounding technique for locating inactive, hidden turtles. A cone-like rod of aluminum tubing tapered to a blunt point is used to probe through leaves or debris at the bases of bushes, trees, or small hollows. If the rod strikes the carapace of a turtle, a hollow sound is made which is easily discernible from that of a piece of wood or stone.

The hand snare is a widely recognized method for collecting reptiles, particularly lizards. Eakin (1957) describes a copper wire noose for collecting lizards. A slip noose is formed with an 8 inch piece of

American Standard wire gauge size of 34. A light pole about 5 feet long carries the other free end of the wire noose. The snare's loop encompases the head of a lizard and is then jerked tight. A 2 or 3-pound test monofilament line is useful for smaller lizards.

Stickel (1944) describes a noose with a trigger mechanism. A slender rod, 3 to 5 feet long, forms the shaft of the snare. A cord or thread attaches to one end and is guided along the shaft. Near the base of the stick the cord ends in a loop around a rubber band consisting of a 4 inch loop of inner tubing approximately .125 inch wide. A bent nail secures this rubber loop at the end of the shaft. A trigger stick with a protruding nail attaches 8 inches from the bent nail. To load, the elastic band stretches and holds under the end of the trigger nail. The cord then forms into a loop measuring 1 x 1.5 inch at the tip of the rod. The trigger is ready to operate (Figure 6).

Where the firing of guns is not desired, a manually discharged chain of rubber bands provides an alternative for stunning lizards (Brown, 1946). Dundee (1950) describes a wooden gun for discharging bands of rubber fashioned from automobile tubes. A clothespin provides the triggering device (Figure 7).

Another gun simply employs a small board with a series of notches cut in it (Neill, 1956). A band of rubber stretches from the end of the board to a notch; several bands can be loaded one to a notch. Rolling a rubber band upward over its notch releases it (Figure 8).

Stebbins (1966) reports that by driving slowly along highways at night, several species of snakes, geckos, toads, and salamanders can be collected. Ideal roads possess a dark color, little traffic, and no curbs. Bright moonlight, wind, and cool temperatures (below 60°-65°F) negatively affect night collection. This method is most useful in desert areas of the Southwest during spring months or during the summer rainy season.

Shaw (1962) presents a novel approach to an old collecting technique. This technique involves the aid of the local populace in acquisition of specimens, even by spot announcements on local radio stations. This method is not limited to any particular animal and is most effective.

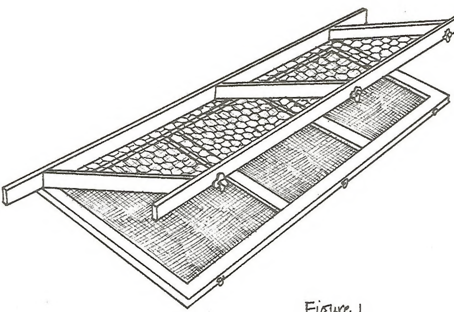
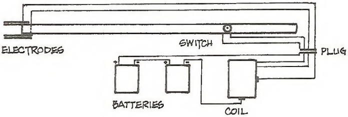


Figure 1



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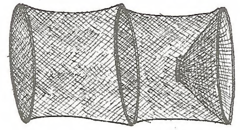

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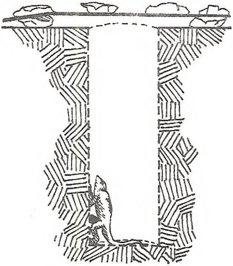

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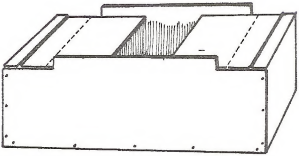

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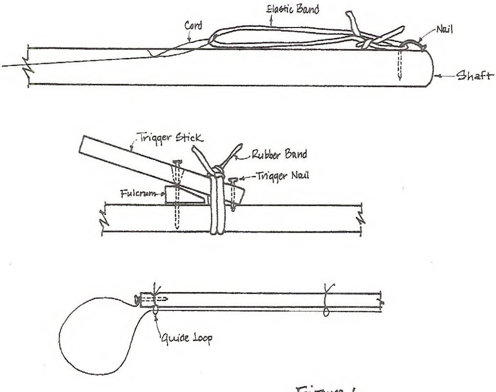

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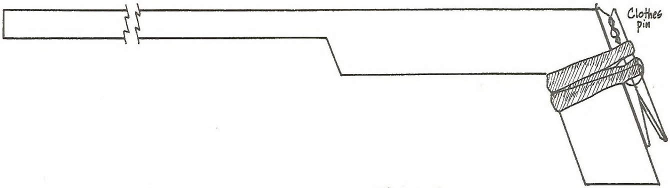

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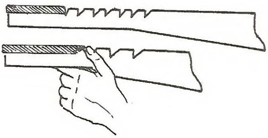

Figure 8

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